SUPERFUND PRELIMINARY SITE CLOSE OUT REPORT
ROCKY HILL MUNICIPAL WELL SITE
BOROUGH OF ROCKY HILL, SOMERSET COUNTY, NEW JERSEY

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Prepared by

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I. INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has determined that all construction activities at the Rocky Hill Superfund Site (Site) have been completed in accordance with EPA's *Close Out Procedures for National Priorities List Sites* (OSWER Directive 9320.2-09A-P, January 2000). The selected remedial action has been constructed. The remedial action consisted of the construction of two groundwater pump and treatment plants, treatment of contaminated water using granular activated carbon (GAC) and discharge of treated water to surface water. The remedial action was performed as a federally funded action. EPA entered into an Inter-Agency Agreement with the U.S. Army Corps of Engineers (USACE) to perform the remedial construction. USACE contracted with Cape Environmental to construct the remedy. All work was performed in accordance with the 1988 Record of Decision (ROD) and has been modified by the August 2005 Explanation of Significant Differences (ESD). As a result of the actions taken at the Site, all human and environmental exposure to site contaminants are under control.

II SUMMARY SITE OF CONDITIONS

Background

The Rocky Hill Municipal Well (RHMW) Site is located in Somerset County, New Jersey in the vicinity of the intersection of U.S. Route 206 and south of N.J. Route 518. The Rocky Hill Municipal Well is located on a 2 acre tract of land in the Borough of Rocky Hill, which services the residents of Rocky Hill.

RHMW wells numbered 1 and 2 were constructed in 1936. These two wells provided a source of potable water to the Borough of Rocky Hill. Well number 1 was abandoned and sealed between 1976 and 1978. In 1978, a study by Rutgers University on the RHMW revealed trichloroethene (TCE) contamination in groundwater at levels of approximately 25 parts per billion (ppb). Continued testing of this well by the Borough of Rocky Hill from 1978 to 1983 indicated that the TCE concentration ranged from about 50 ppb to 200 ppb. Due to the elevated levels of TCE in groundwater, well number 2 was closed in November 1979. Levels of TCE in the well water eventually declined, and the well was subsequently reopened. Levels of TCE, however, increased, and the well was closed for a second time in January 1982. During the shutdown of well number 2, the Borough of Rocky Hill obtained potable water from Elizabethtown Water Company. After the installation of two air stripping units by the Borough for

well number 2, the well reopened as a potable source of water in July 1983. Discovery of contamination in the Rocky Hill Municipal Well led the New Jersey Department of Environmental Protection (NJDEP) to sample the residential wells of the neighboring Montgomery Township Housing Development (MTHD). The sample results detected the presence of TCE in domestic wells of residences within the MTHD. In March 1981, Elizabethtown Water Company began to install water lines in the MTHD, and residents were advised not to use well water. Alternate water supply lines were subsequently hooked up to all residential properties in the MTHD with the exception of three residences where the property owners refused to use water supplied by Elizabethtown Water Company.

In 1983, the Site was included on the National Priorities List. In 1984, NJDEP entered into a Cooperative Agreement with EPA under which it performed the remedial investigation and feasibility study (RI/FS) for the RHMW Site.

In April 1988 NJDEP issued a remedial investigation (RI) report which identified the nature and extent of the groundwater contamination and concluded that the source of groundwater contamination to the RHMW and MTHD Sites was at or in the vicinity of the Princeton Gamma-Tech, Inc. facility located on Route 518.

Selection of Remedial Actions

EPA issued RODs for both the MTHD and RHMW Sites in June 1988. Both Sites are being addressed jointly due to their close proximity and the similarity of contaminants present. One remedy was chosen which addresses the entire groundwater contaminant plume beneath the Sites. The remedy called for the extraction of contaminated groundwater from the primary source area of the contaminant plume followed by on-site treatment and reinjection of the treated water back into the underlying aquifer; connection of affected residences to the public water supply; sealing of private water supplies within the contaminant plume; and implementation of a groundwater sampling program to monitor the effectiveness of the cleanup.

In 1988, the New Jersey Department of Environmental Protection (NJDEP) began to design the remedy for the Site employing Camp, Dresser, & McKee (CDM) as it's contractor. Initial remedial design (RD) work included construction and sampling of new monitoring wells, and sampling of existing monitoring wells. During the RD it was found that contamination had been detected in a down gradient well (MW-19), located on the east side of the Millstone River, that

did not previously contain detectable levels of TCE in previous sampling events. This indicated that the contaminated groundwater plume was migrating beyond previously estimated contamination boundaries. The RD also indicated the concentrations of TCE found in a major source area of groundwater contamination in the Princeton Gamma-Tech, Inc. property well (well PGTMW-1) had decreased from 5,000 ppb in the 1980s to 1,800 ppb of TCE by 1992. The maximum concentration of TCE in the well continued to decline over the next ten years to 320 ppb.

In 1991, cost recovery litigation was initiated between the Potentially Responsible Parties (PRPs) and EPA. In 1994, the PRPs indicated an interest in negotiating the implementation of the remedy and the RD contract between NJDEP and CDM was suspended. During this period of negotiations, another potential source of contamination was identified. Separate negotiations began in 1995 between EPA and a prior operator and current owner of the former Fifth Dimension Facility to investigate this other potential source of contamination. Negotiations were unsuccessful and EPA conducted an investigation at the property. The results of the investigation at the Former Fifth Dimension Facility showed that it was a source of TCE groundwater contamination with a maximum concentrations of 89 ppb of TCE in groundwater.

In December of 1996, the lead for the remedial design and implementation of the remedy for the Site was transferred from NJDEP to EPA.

In January 1998 EPA performed a limited groundwater sampling event to determine the current vertical and horizontal extent of the groundwater contaminant plume. The analytical results showed that TCE contamination concentrations, while still significantly elevated above the state drinking water standard of 1 ppb, had further decreased. TCE was detected in the groundwater at the Sites at levels ranging from non-detect to a high of 320 ppb.

EPA restarted the RD work following the conclusion of unsuccessful settlement negotiations between the parties in 1999. In August 1999, EPA entered into an interagency agreement with the USACE for the completion of RD work at the Site. USACE contracted with CDM Federal Programs Corporation to complete the RD.

In 2001, EPA re-evaluated the remedy selected in the 1988 ROD in order to assure its technical merits and conformance with all current Agency guidance and policy. This re-evaluation included the

review of all relevant guidance and policy generated since the ROD to determine if post-ROD policy and guidance would have an impact on the planned cleanup at the Site. This review indicated that the selected remedy complies with all current, relevant guidance and policy, is protective of human health and the environment and remains the appropriate remedy to address contamination at the Site.

CDM resumed RD field work in February 2001. As part of this work, 20 bedrock monitoring wells were re-constructed to further refine groundwater sample collection. Following bedrock monitoring well reconstruction, additional rounds of groundwater sampling were conducted in 2002. The information obtained from these sampling events suggests that concentrations of TCE decreased in the aquifer between 1998 and 2002. Although levels have decreased from those found in previous sampling events, TCE contamination in groundwater remains at levels much greater than the health-based Maximum Contaminant Level for TCE of 1 ppb.

The remedial design for the groundwater pump and treatment systems called for pumping the contaminated groundwater from two areas of the contaminant plume containing concentrations of TCE higher than 100 ppb. Areas of the plume exceeding TCE concentrations of 100 ppb are known as primary source areas. The remedial design called for the treatment of groundwater extracted from the primary source areas with GAC and discharge of treated water to a surface water body. The treatment using GAC and discharge to surface water, called for in the design represented a change to the remedy selected in the 1988 ROD. The ROD specified treatment by air stripping and reinjection of the treated water back into the underlying aquifer.

Air stripping and GAC adsorption are both recognized by EPA as best available technologies (BATs) and presumptive ex-situ treatment technologies for VOC removal from water. A technical evaluation of these two treatment options supported the use of GAC adsorption based upon cost savings and broader operational flexibility and control (e.g., hydraulic operating range, effective treatment range according to influent water quality).

Given the reduced size of the primary TCE plume and the simplified and less costly operation of the surface discharge of treated water, it was determined that injection of treated water was not required to provide hydraulic control and to flush contaminants from the aquifer. Furthermore, injection wells are prone to biological and inorganic fouling as a result of differences in water chemistry between the groundwater effluent and the aquifer. Chemical and physical treatment of injection wells is typically required on a

routine basis in order to maintain adequate hydraulic capacity for reinjection. Even with such treatment, hydraulic capacity generally decreases with time, eventually resulting in the need to replace injection wells. Given these considerations, surface water discharge via connection to the existing storm water sewers was chosen as the preferred option for effluent disposal. The change in the treatment and discharge components to the remedy have been documented in an ESD issued in August 2005.

Remedial Construction Activities

Following completion of remedial design activities in August 2003, the Army Corps of Engineers awarded a contract for the construction and operation of two groundwater treatment systems to Cape Environmental. The contract award was followed by the submittal of the remedial action work plan which was approved in January of 2004.

Construction activities for the remedy began on March 15, 2004. Construction activities included the installation of eight recovery wells and the construction of two treatment plants.

One of the targeted remediation zones is the primary source area located on the northern end of the of the site. This area is roughly centered on the property at 1377 Route 206 where Ground Water Treatment Facility #1 (GWTF #1) and its six recovery wells were constructed. The targeted remediation zone for this area of the plume extends vertically from 50 feet to 200 feet below ground surface and is enclosed horizontally by the existing 100 ppb TCE isoconcentration contour. The objective of the capture zone was to achieve capture of the targeted remediation zone. GWTF #1 was constructed at 1377 Route 206 and three pairs of recovery wells were installed within the primary source area located under that property. The paired recovery wells (i.e. shallow and deep) for GWTF #1 were designed to avoid creating a conduit for vertical migration of contamination from the shallow bedrock to the deeper bedrock. Two of the three pairs of wells generated adequate amounts of water that produced a flow rate of 56 gallons per minute into the treatment plant. The third pair, recovery well 3S and recovery well 3D, were not productive and were converted into monitoring wells. Groundwater level monitoring is currently being conducted to determine the extent of the capture zone associated with GWTF #1.

A second smaller primary source area is located to the south underlying the Princeton Gamma Tech property near the intersection of Routes 206 and 514. Two recovery wells were installed on this

property. These two wells were constructed to extract groundwater within the primary source area underlying this property that extends vertically between 25 to 100 feet below ground surface within the weathered bedrock and shallow bedrock aquifer. These two recovery wells pump a total of six gallons per minute of extracted groundwater into a portable trailer mounted treatment unit known as Groundwater Treatment Facility #2(GWTF #2). This treatment unit, similar to GWTF #1, uses GAC to treat extracted groundwater and discharges treated water to a surface water body via a storm sewer.

Construction activities of the recovery wells, a number of additional monitoring wells, and GWTF #1 and #2 were completed on January 11, 2005.

Performance and startup testing on the groundwater treatment systems began on January 11, 2005 and consisted of a 14 day pump test. The 14 day pump test was satisfactorily completed on January 25, 2005. A final inspection of the two groundwater pump and treatment plants was conducted by EPA, NJDEP, and USACE on February 1, 2005. The two treatment plants have been running continuously since January 2005. GWTF #1, is currently pumping contaminated water from the aquifer at its designed flow rate of 56 gallons per minute. GWTF #2, located on the Princeton Gamma Tech property, is currently pumping at its designed flow rate of 6 gallons per minute.

A draft Operations and Maintenance Manual will be submitted to EPA on October 17, 2005 and will be reviewed by EPA and NJDEP.

Post Construction Activities

GWTF #1 and GWTF #2 continue to operate at a combined flow of 62 gallons per minute (gpm) extracting groundwater from the two primary source areas. Over eleven million gallons of contaminated groundwater have been pumped from the primary source areas and have been treated and discharged to date. Cape Environmental, through a contract with the USACE, will continue to provide maintenance and groundwater monitoring through the first year of operation. GWTF #1 is expected to pump groundwater from the primary source area located at 1377 Route 206 for 25 years before attaining the groundwater cleanup goal of 1 ppb TCE within the capture zone. It is estimated that it will take 10 to 15 years of pumping from GWTF #2 to achieve the cleanup goal of 1 ppb TCE in primary source area located at the Princeton Gamma Tech property.

The operation of the GWTF #1 and GWTF #2 systems should effectively remove site related contaminants from primary source areas in the aquifer. The secondary plume of groundwater contamination, where TCE concentrations are less than 100 ppb, will be allowed to naturally attenuate. VOC concentrations and natural attenuation parameters will be monitored in the secondary plume on a regular basis as part of the long-term groundwater sampling program.

EPA has worked closely with officials of the Borough of Rocky Hill during the implementation of the remedy. The Borough of Rocky Hill raised a concern that the treatment plants may draw water away from the Rocky Hill Municipal Well and diminish the Borough's capacity to supply water to its residents. In response to this concern, EPA collected groundwater level data from monitoring wells in the area prior to start up of the treatment systems. In addition, in November, 2004 EPA placed a water level recorder in the Rocky Hill Municipal Well to directly measure aquifer drawdown by the Rocky Hill Municipal Well. After treatment system start up, water level data from surrounding monitoring wells and the Rocky Hill Municipal Well were gathered. The data indicates that, as predicted by groundwater modeling, pumping by the remediation systems had no effect on the water levels in the municipal supply well. EPA will continue to monitor water levels in surrounding monitoring wells and the Rocky Hill municipal supply well and share this information with the Borough.

NJDEP intends to establish a Classification Exception Area within the area of groundwater contamination to regulate the installation of additional wells within the contaminated groundwater plume.

III DEMONSTRATION OF CLEANUP ACTIVITY QUALITY ASSURANCE/QUALITY CONTROL

Construction activities at the site were determined to be consistent with the ROD and RD specifications.

The construction contractor has adhered to the approved Contractor Quality Control Plan (CQCP). USACE performed oversight of construction activities for the remediation of the Site which included, among other things, field oversight, review and approval of submittals, and compliance with the required specifications of the design and approved work plans. In addition, EPA and NJDEP personnel periodically visited the Site during construction and operation phases.

All applicable EPA and NJDEP quality assurance and quality control (QA/QC) procedures and protocols were incorporated into the RD. EPA analytical methods were used for all monitoring samples during all RA activities. Sample analyses were performed at state-certified laboratories.

The QA/QC program used throughout the RA was rigorous and in conformance with EPA and NJDEP standards; therefore, EPA and NJDEP have determined that all analytical results are accurate to the degree needed to assure satisfactory execution of the RA, and that they are consistent with both the ROD, the ESD, and the RD specifications.

All pump and treatment system equipment was furnished by reputable manufacturers and suppliers. Manufacturers and suppliers advised the contractor on the installation of the equipment, which was tested according the manufacturers' specifications and guidelines.

All equipment used in the treatment process was tested and began operation with potable water. Once it had been determined that the facilities was prepared to receive the contaminated groundwater, start-up procedures for the recovery wells commenced. The pump and treatment systems were monitored during the start-up period. Water quality data were collected to evaluate the effectiveness of the pump and treatment systems to ensure that the quality of the influent was similar to that anticipated. The water levels in various monitoring wells were also collected to monitor the decline in water levels which resulted from pumping. Sampling was also performed during the start-up period to monitor system operations. Samples of the treatment system influent and effluent were tested for general water quality parameters and parameters required under the New Jersey Pollutant Discharge Elimination System permit equivalence. The results indicate that the effluent quality meets discharge requirements. These data will aid EPA in assessing the treatment system's performance over time.

IV. ACTIVITIES AND SCHEDULE FOR SITE COMPLETION

All remedial action construction activities called for by the ROD, the ESD, and the RD for the Rocky Hill Municipal Well Superfund site have been completed.

The activities that remain to be completed for the Site include approving the following reports: Operations and Maintenance Manual, Final Close Out Report, Five Year Reviews, and deletion of the site

from the National Priorities List. These activities will be completed according to the following schedule.

The following table lists the schedule of activities that remain to be completed for the Site:

Task	Estimated Completion	Responsible Organization
Approval of Final Groundwater Pump and Treatment systems O&M Manual	August 2005	EPA/NJDEP
Approve Interim Remedial Action Report	September 2005	EPA
One year Operational and Functional Period	January 2006	EPA
Classification Exception Area	December 2006 (estimated)	NJDEP
Conduct First Five-year Review	August 2010	EPA
Long Term Response Action of Groundwater Treatment Systems	January 2016	EPA
O&M of Groundwater Treatment Systems	January 2036	NJDEP
Long-Term Groundwater Sampling Events	Data Collected Quarterly	EPA
Groundwater Treatment Systems Progress Reports	Produced Quarterly	EPA
Approve Final Remedial Action Report	To Be Determined	EPA
Approve Final Close Out Report	To Be Determined	EPA
Deletion from NPL	To Be Determined	EPA

V. SUMMARY OF SITE REMEDIATION COSTS

The estimated total cost with present worth for the selected remedy for both the RHMW and the MTHD sites in the 1988 ROD was $4,652,000. This includes an estimated capital cost of $2,516,000 for the construction of the treatment plants, recovery wells, providing private water supply to affected residential properties, and sealing of residential wells. The final cost to EPA for this remedial action at the RHMW and MTHD sites was $5,050,000.

VI. FIVE-YEAR REVIEW

Upon completion of the remedial activities, hazardous substances will not remain on-site above levels that would prevent unlimited use without restriction. It is the policy of EPA to conduct five year reviews when remedial activities, including monitoring, will continue for more than five years. The first five-year review will be completed before August 2010.

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8/24/05
Date